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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/699,224	10/27/2000	Peter A. Rice	BOS/3	8386

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EXAMINER	
DEVI, SARVAMANGALA J N	
ART UNIT	**PAPER NUMBER**
1645	

DATE MAILED: 12/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/699,224	RICE ET AL.	
	Examiner	Art Unit	
	S. Devi, Ph.D.	1645	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 July 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10,12,13 and 15-31* is/are pending in the application.

4a) Of the above claim(s) *17-31* is/are withdrawn from consideration.

5)☒ Claim(s) *16* is/are allowed.

6)☒ Claim(s) *1-10,12,13 and 15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10/27/00* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Response to Applicants' Amendment

Applicants' Amendment

1) Acknowledgment is made of Applicants' amendments filed 07/29/05 and 09/19/05 in response to the non-final Office Action mailed 01/28/05.

Status of Claims

2) Claims 1, 2, 5, 12, 13, 15 and 16 have been amended via the amendment filed 10/21/04.

Claims 1-10, 12, 13 and 15-31 are pending.

Claims 1-10, 12, 13, 15 and 16 are under examination.

Prior Citation of Title 35 Sections

3) The text of those sections of Title 35 U.S. Code not included in this action can be found in a prior Office Action.

Prior Citation of References

4) The references cited or used as prior art in support of one or more rejections in the instant Office Action and not included on an attached form PTO-892 or form PTO-1449 have been previously cited and made of record.

Objection(s) Maintained

5) The objection to the drawings made in paragraph 6 of the Office Action mailed 02/26/03 and maintained in paragraph 6 of the Office Action mailed 01/28/05 under 37 C.F.R 1.84 is maintained for reasons set forth therein.

Rejection(s) Withdrawn

6) The rejection of claim 2 made in paragraph 13(a) of the Office Action mailed 01/28/05 under 35 U.S.C § 112, second paragraph, as being indefinite, is withdrawn in light of Applicants' amendment to the claim.

7) The rejection of claim 5 made in paragraph 13(b) of the Office Action mailed 01/28/05 under 35 U.S.C § 112, second paragraph, as being indefinite, is withdrawn in light of Applicants' amendment to the claim.

8) The rejection of claim 16 made in paragraph 13(c) of the Office Action mailed 01/28/05 under 35 U.S.C § 112, second paragraph, as being indefinite, is withdrawn in light of Applicants' amendment to the claim.

9) The rejection of claims 12 and 13 made in paragraph 13(d) of the Office Action mailed 01/28/05 under 35 U.S.C § 112, second paragraph, as being indefinite, is withdrawn in light of Applicants' amendment to the claims.

10) The rejection of claim 13 made in paragraph 13(e) of the Office Action mailed 01/28/05 under 35 U.S.C § 112, second paragraph, as being indefinite, is withdrawn in light of Applicants' amendment to the claim.

11) The rejection of claim 13 made in paragraph 13(f) of the Office Action mailed 01/28/05 under 35 U.S.C § 112, second paragraph, as being indefinite, is withdrawn in light of Applicants' amendment to the claim.

12) The rejection of claims 4-10 and 15 made in paragraph 13(e) of the Office Action mailed 01/28/05 under 35 U.S.C § 112, second paragraph, as being indefinite, is withdrawn in light of Applicants' amendment to the claims.

13) The rejection of claims 1, 3-6, 8 and 15 made in paragraph 14 of the Office Action mailed 01/28/05 under 35 U.S.C § 102(b) as being anticipated by Magdalene *et al.* (WO 85/04654), is withdrawn in light of Applicants' amendment to the claim.

14) The rejection of claim 7 made in paragraph 16 of the Office Action mailed 01/28/05 under 35 U.S.C § 103(a) as being unpatentable over Magdalene *et al.* (WO 85/04654) as applied to claim 6 above and further in view of Clements (*Inf. Immun.* 58: 1159-1166, 1990), is withdrawn in light of Applicants' amendment to the base claim.

15) The rejection of claim 9 made in paragraph 17 of the Office Action mailed 01/28/05 under 35 U.S.C § 103(a) as being unpatentable over Magdalene *et al.* (WO 85/04654) as applied to claim 1 above and further in view of Tam (*In*: *Peptide Antigens*: *A Practical Approach.* (Ed) Wisdom G.B. IRL Press, Oxford University Press, New York, pp. 83-90. 1994), or Huang *et al.* (*Mol. Immunol.* 31: 1191-1199, 1994), is withdrawn in light of Applicants' amendment to the base claim.

16) The rejection of claims 1, 2, 10, 12, 13 and 15 made in paragraph 15 of the Office Action mailed 01/28/05 under 35 U.S.C § 102(b) as being anticipated by Kufer *et al.* (WO 98/46645 A2), is withdrawn. A modified rejection is set forth below to reject the claims as amended.

Response to Applicants' Arguments on Kufer *et al.*

17) Applicants submit the following arguments: (a) Kufer *et al.* relates to the development of antibody-like molecules that act as receptors for human tumor antigens (see Kufer *et al.*, page 1, second full paragraph). (b) The peptides listed in Kufer *et al.* were designed as mimics of the human tumor antigen 17-1A, also known as EPCAM. The Kufer's work is in a field wholly unrelated to gonococcal epitope immunization. (c) Applicants have not claimed the bare consensus sequence of SEQ ID NO: 8, DE GLF. While Applicants have taught that this consensus sequence is correlated with the capacity to induce a specific anti-gonococcal immune response, peptides bearing this consensus sequence may exist that are not capable of inducing in a mammal an immune response against a conserved gonococcal lipo-oligosaccharide (LOS) epitope. (d) Because the Kufer's peptides have never been tested for their immunogenic properties as they relate to gonococcal epitopes, Kufer *et al.* cannot be said to unambiguously anticipate the claim limitation 'capable of inducing in a mammal an immune response against a conserved gonococcal lipooligosaccharide (LOS) epitope.' (e) Because Kufer's peptide in question does not unambiguously satisfy every limitation of applicants' claims, it cannot anticipate those claims.

Applicants' arguments have been carefully considered, but are not persuasive. The peptide mimic of claim 1 is less than 50 amino acids in length and lacks a specific structure limit. The peptide mimic as claimed in claim 2 comprises the amino acid sequence of SEQ ID NO: 8. Irrespective of the Kufer's work being allegedly in a field unrelated to gonococcal epitope immunization, Kufer's isolated or synthetic 13 amino acid-long synthetic peptide comprises the amino acid sequence of DESGLF, which is structurally 100% identical to the instantly recited amino acid sequence of SEQ ID NO: 8. See the sequence search report attached to the Office Action mailed 01/28/05; Example V; and item 39 in Table 3 of Kufer *et al.* Kufer's isolated or synthetic 13 amino acid-long synthetic peptide comprising the instantly recited SEQ ID NO: 8, DESGLF, fully meets the structural limitations in instant claims 1 and 2. Kufer *et al.* also taught a

composition comprising the peptide and a buffer (see page 41). Although Kufer *et al.* are silent about their peptide being a mimic of a conserved gonococcal lipooligosaccharide epitope that is not found on human blood group antigens and about its ability to induce any immune response or a T-cell dependent immune response in a mammal to said epitope, or its ability to compete with gonococcal LOS for binding to 2C7 monoclonal antibody, because of the 100% structural identity, the prior art peptide is viewed as the same as the Applicants' peptide mimic. The Office's position that Kufer's peptide is the same as the Applicants' peptide is based upon the fact that the structure of Kufer's peptide and the structure of Applicants' peptide mimic are identical. There is 100% structural identity between the prior art peptide and Applicants' peptide mimic having SEQ ID NO: 8. Therefore, Kufer's 13 amino acid-long peptide qualifies as a less than 50 amino acid-long peptide mimic. Therefore, in spite of the fact that Kufer *et al.* fail to teach all of Applicants' disclosed functional characteristics of the peptide, there is sufficient overlap to reasonably conclude that Kufer's DESGLF-containing peptide is one and the same as the Applicants' peptide mimic. Since the prior art peptide is structurally the same as the Applicants' peptide mimic, for example the one recited in the dependent claim 2, it is expected not to be found on human blood group antigens; is expected to have the capability to induce an immune response or a T cell-dependent immune response in a mammal against a conserved gonococcal epitope; and is expected to immunospecifically bind 2C7 monoclonal antibody, or the monoclonal antibody produced by the hybridoma recited in claim 13. The capacity to induce an immune response or a T cell-dependent immune response in a mammal against a conserved gonococcal LOS epitope is viewed as an inherent property inseparable from the peptide of Kufer *et al.* Two peptides that are identical in structure or amino acid composition necessarily have identical functional characteristics. The limitation in claim 15 'for immunizing against *N. gonorrhoaeae* infection' represents intended use of the composition.

New Rejection(s) Based on Applicants' Amendments

The rejection(s) set forth below are necessitated by Applicants' amendments to the claims.

Rejection(s) under 35 U.S.C § 112, First Paragraph

18) Claim 13 and those dependent therefrom are rejected under 35 U.S.C § 35 U.S.C § 112, first

paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. This is a new matter rejection.

Claim 13, as amended, includes the limitation: 'antigen-binding' fragment thereof and hybridoma cell line having the specific immunological reactivity of 'monoclonal antibodies produced by hybridoma cell line' HB 11311 as deposited with the ATCC. Applicants point to lines 9-19 of page 6 of the specification and state that this part of the specification provides descriptive support for the now added limitation 'antigen-binding fragment thereof'. However, this part of the specification, as cited below, describes an antibody, but not any 'antigen-binding fragment thereof' and no hybridoma cell line having the specific immunological reactivity of 'monoclonal antibodies produced by hybridoma cell line' HB 11311 as deposited with the ATCC.

> As predicted by the Jerne "network" theory (23), immunization with an anti-idiotypic antibody (Ab2) that is directed against antigen combining sites of primary antibody (Ab1), may elicit a humoral immune response specific for the nominal antigen. The resulting anti-anti-idiotypic antibody (or Ab3) should react with the original primary antigen. If the primary antigen is an oligosaccharide (and therefore expected to give a T-cell independent immune response), then immunization with Ab2 (the protein equivalent) may elicit a T-cell dependent response.

Applicants further contend that: (a) one of skill in the art as of the filing date of the specification was aware of the kinds of fragments that retain the antigen-binding portion of the molecule, such as Fab, Fab`, F(ab)2 and F(v) fragments; and (b) one of skill in the art was aware that to achieve immunospecific binding, it is important to retain the complementarity determining regions in any antibody fragment. The support for the new limitations has to come from Applicants' specification, as originally filed. In the instant application, the above-identified limitations lack descriptive support in the originally filed specification, as explained above. Therefore, the above-identified limitations in the claims are considered to be new matter. *In re Rasmussen*, 650 F2d 1212 (CCPA, 1981). New matter includes not only the addition of wholly unsupported subject matter but also, adding specific percentages or compounds after a broader original disclosure, or even omission of a step from a method. See M.P.E.P 608.04 to 608.04(c).

Applicants are respectfully requested to point to the descriptive support in the specification as filed, for the newly added limitation(s), or to remove the new matter from the claim(s).

Rejection(s) under 35 U.S.C § 112, Second Paragraph

19) Claims 13 and 15 are rejected under 35 U.S.C § 112, second paragraph, as being indefinite, for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention.

(a) Claim 13 is vague, indefinite and confusing in the limitation: hybridoma cell line having the specific immunological reactivity of 'monoclonal antibodies produced by hybridoma cell line' HB 11311 as deposited with the ATCC. Does it mean that the recited hybridoma cell line produces more than one type of monoclonal antibodies?

(b) Claim 15, which depends from claim 13, is also rejected as being indefinite because of the indefiniteness identified above in the base claim.

Rejection(s) under 35 U.S.C § 102

20) Claims 1-3, 10, 12, 13 and 15 are rejected under 35 U.S.C § 102(b) as being anticipated by Kufer *et al.* (WO 98/46645 A2, already of record).

It is noted that the peptide mimic claimed in claim 1 lacks a specific structure limit. The limitation in claim 15 'for immunizing against *N. gonorrhoaeae* infection' represents intended use of the composition and therefore has no patentable weight.

Kufer *et al.* taught a 13 amino acid-long synthetic peptide having the amino acid sequence of DESGLF, which is 100% structurally identical to the instantly recited amino acid sequence of SEQ ID NO: 8. See the sequence search report attached to the Office Action mailed 01/28/05; Example V; and item 39 in Table 3 of Kufer *et al.* Since the prior art peptide is a synthetic peptide, it inherently serves as an isolated peptide. Kufer's isolated or synthetic 13 amino acid-long synthetic peptide comprising the instantly recited SEQ ID NO: 8, DESGLF, fully meets the structural limitations in instant claims 1 and 2. Kufer's 13 amino acid-long peptide qualifies as a less than 50 amino acid-long peptide mimic. Kufer *et al.* taught a composition comprising the peptide and a buffer (see page 41). Although Kufer *et al.* are silent about the peptide being a mimic of a conserved gonococcal LOS epitope that is not found on human blood group antigens and about its ability to induce an immune response in a mammal to said epitope or its ability to compete with gonococcal LOS for binding to 2C7 monoclonal antibody, the prior art peptide is viewed as the

same as the Applicants' peptide mimic, because of its structural identity with the instantly recited peptide. The Office's position that Kufer's peptide is the same as the Applicants' peptide is based upon the fact that the structure of Kufer's peptide and the structure of Applicants' peptide mimic are identical. There is 100% structural identity between the prior art peptide and Applicants' peptide mimic having SEQ ID NO: 8. Therefore, in spite of the fact that Kufer *et al.* fail to teach all of Applicants' disclosed characteristics of the peptide, there is sufficient overlap to reasonably conclude that Kufer's peptide is one and the same as the Applicants' peptide mimic. Since the prior art peptide is structurally the same as the Applicants' peptide mimic, for example the one recited in claim 2, it is expected not to be found on human blood group antigens; is expected to have the capability to induce an immune response or a T cell-dependent immune response in a mammal against a conserved gonococcal LOS epitope; and is expected to immunospecifically bind 2C7 monoclonal antibody, or the monoclonal antibody produced by the hybridoma recited in claim 13. The capacity to induce an immune response or a T cell-dependent immune response in a mammal against a conserved gonococcal epitope is viewed as an inherent property inseparable from the peptide of Kufer *et al.*

Claims 1-3, 10, 12, 13 and 15 are anticipated by Kufer *et al.*

Rejection(s) under 35 U.S.C § 103

21) Claims 4-9 are rejected under 35 U.S.C § 103(a) as being unpatentable over Kufer *et al.* (WO 98/46645 A2, already of record) as applied to claim 1 above and further in view of Huang *et al.* (*Mol. Immunol.* 31: 1191-1199, 1994, already of record) and Tam (*In*: *Peptide Antigens*: *A Practical Approach*. (Ed) Wisdom G.B. IRL Press, Oxford University Press, New York, pp. 83-90, 1994, already of record).

The teachings of Kufer *et al.* are explained above, which do not disclose the peptide mimic being a part of a multiple-antigen peptide or MAP.

However, it was routine and conventional in the art at the time of the invention to modify a peptide as a multiple antigen peptide with a built-in-adjuvant for the purpose of providing a very high density of the peptide epitope. For instance, see the teachings of Tam on pages 87, 83 and 84.

Huang *et al.* taught the disadvantage of presenting a peptide as a peptide-protein carrier or as

an adjuvant mixture, the disadvantage being the difficulty in defining the chemical composition and stoichiometry of such a mixture. Huang *et al.* taught the advantages of presenting a peptide via a MAP system using a lipophilic tripalmitoyl-derivatized cysteine, wherein the lipophilic moiety plays the dual role of serving both as an anchor and a built-in adjuvant. Huang *et al.* taught that the MAP system permits the amplification of antigens 4- to 8-fold to attain a macromolecule and avoids the use of a protein carrier as well as attendant structural ambiguity. See pages 1191-1193.

Therefore, it would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made to modify Kufer's peptide comprising SEQ ID NO: 8, DESGLF, as a multiple antigen peptide using a lipophilic cysteine-containing built-in-adjuvant as taught by Huang *et al.*, to produce the instant invention, with a reasonable expectation of success. One of skill in the art would have been motivated to produce the instant invention for the expected benefit of presenting Kufer's peptide as a multiple antigen peptide by coupling with a lipophilic cysteine-containing built-in-adjuvant for the purpose of advantageously providing a very high density of the peptide mimic as taught by Tam, and for avoiding the use of a protein carrier and avoiding structural ambiguity of the conjugate as taught by Huang *et al.*

Claims 4-9 are *prima facie* obvious over the prior art of record.

Remarks

22) Claims 1-10, 12, 13, and 15 stand rejected. Claim 16 is allowable.

23) Applicants' amendments necessitated the new ground(s) of rejection presented in this Office action. **THIS ACTION IS MADE FINAL.** Applicants are reminded of the extension of time policy as set forth in 37 C.F.R 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 C.F.R 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

24) Papers related to this application may be submitted to Group 1600, AU 1645 by facsimile transmission. Papers should be transmitted via the PTO Fax Center, which receives transmissions 24 hours a day and 7 days a week. The transmission of such papers by facsimile must conform with the notice published in the Official Gazette, 1096 OG 30, November 15, 1989. The Fax number for submission of amendments, responses and/or papers is (571) 273-8300.

25) Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAG or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.Mov. Should you have questions on access to the Private PAA system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

26) Any inquiry concerning this communication or earlier communications from the Examiner should be directed to S. Devi, Ph.D., whose telephone number is (571) 272-0854. A message may be left on the Examiner's voice mail system. The Examiner can normally be reached on Monday to Friday from 7.15 a.m. to 4.15 p.m. except one day each bi-week, which would be disclosed on the Examiner's voice mail system.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Lynette Smith, can be reached on (571) 272-0864.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (571) 272-1600.

December, 2005

SD
S. DEVI, PH.D.
PRIMARY EXAMINER